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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 09/684,528 | 10/06/2000 | Andrew K. Percy | X-444-2P-2 US | 1500 |
| 24309 | 7590 | 12/01/2003 | EXAMINER | |
| XILINX, INC ATTN: LEGAL DEPARTMENT 2100 LOGIC DR SAN JOSE, CA 95124 | | | AHN, SAM K | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2634 | 7 |
| DATE MAILED: 12/01/2003 | | | | |

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

| | | | |
|-------------------------------|--|-------------------------------|--|
| Application No. 09/684,528 | | Applicant(s) PERCEY ET AL. | |
| Examiner Sam K. Ahn | | Art Unit 2634 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 October 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10, 17 and 18 is/are rejected.
- 7) ☒ Claim(s) 11-16 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 October 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5, 6.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Specification

1. The abstract of the disclosure is objected to because it exceeds 150 words.

Correction is required. See MPEP § 608.01(b).

2. The disclosure is objected to because of the following informalities: The Office suggests updating the application number 09/102,704 to patent number 6,400,735 and application number 09/102,740 to patent number 6,289,068 in various parts of the application, ~~including the oath/declaration.~~

Appropriate correction is required.

Drawings

3. Figures 2A~2C should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

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The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claim 10 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The specification does not support the claimed recitation of having adjustment of +2 prior to starting the pattern, where the pattern having the sequence of “ +1, +2, 0, +2, -1, +2, -2, +2 and +2”.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1, 2 and 6 are rejected under 35 U.S.C. 102(e) as being anticipated by

Jeong ('884, cited in the IDS, paper no.4).

Regarding claims 1, 2 and 6, Jeong discloses a method for spreading the electromagnetic emissions of a generated clock signal that is created in response

to a reference clock signal (see Fig.1), comprising the steps of providing a delay line (12) in the path of the reference clock signal, providing an adjustable delay trim units (20, 22 ~22a) in the path of the reference clock signal, enabling or allowing a first, second, third, fourth and fifth set of delay trim units in the delay adjustable delay line during its respective clock period, thereby causing the generated clock signal to exhibit its respective clock period. (see Fig.6 where the clock is outputted from its corresponding delay cell in Fig.1) Further, the clock period is different for each clock period as shown in Fig.6, which is identical to this application's Fig.4. The limitation of comparison of magnitudes between each clock period is also shown in the figure.

Regarding claim 6, Jeong teaches all subject matter, as applied to claim 1. Jeong further teaches an overflow signal (Vctl1, in Fig.1) if the delay trim units enabled in the adjustable delay line reach a predetermined level (2π). (note col.3, lines 30-55)

6. Claims 1, 2, 5, 7-9, 17 and 18 are rejected under 35 U.S.C. 102(e) as being anticipated by **Matsuzaki** et al. ('930).

Regarding claims 1 and 8, Matsuzaki discloses a method for spreading the electromagnetic emissions of a generated clock signal that is created in response to a reference clock signal (see Fig.14), comprising the steps of providing a delay line (11) in the path of the reference clock signal, providing an adjustable delay

trim units (570~579 in Fig.17) in the path of the reference clock signal, enabling a first, second, third, fourth and fifth set of delay trim units in the delay adjustable delay line during its respective clock period, thereby causing the generated clock signal to exhibit its respective clock period where the control signals (Q1~Q4) enables corresponding delay elements and determine the clock period. The control signals (Q1~Q4) are predetermined patterns (see Fig.18) being sent to the variable delay circuits (11,13) to adjust the delay line. (see Fig.15)

Regarding claim 7, Matsuzaki teaches all subject matter claimed, as explained above. Matsuzaki further teaches generating control signals (Q0~Q4) to enable a selective delay trim units in the adjustable delay line (11, 13). Matsuzaki further teaches generating a first control signal, second control signal, and a third control signal by combining the first and second control signals, wherein the third control signal selects different sets of delay trim units resulting in a different clock period (see Fig.18 and note col.17, lines 22-30) where combination of two control signals (Q2, Q4) set to high results in a different time delay.

Regarding claim 2, Matsuzaki teaches all subject matter claimed, as applied to claim 1. Matsuzaki further teaches enabling fourth and fifth set of delay trim units (see Fig.18) by the control signals, which results in a different clock period and wherein the different comparisons of magnitudes of clock period can be viewed

by analyzing the control signals in Fig.18 where the shortest clock period, fourth set, is enabled by the control signal at the bottom of Fig.18, and so on.

Regarding claim 5, Matsuzaki teaches all subject matter claimed, as applied to claim 1. As explained above, Matsuzaki further teaches predetermined pattern in adjusting the delay trim units. (see Fig.18)

Regarding claims 9 and 18, Matsuzaki teaches all subject matter claimed, as applied to claim 8. Matsuzaki further teaches the step of providing an offset (output of 15, d-l-clk, as the reference signal is adjusted by the variable delay) in the reference signal prior to the step of adjusting (13), which is to minimize the worst-case scew introduced between the reference clock signal and the generated clock signal, since the offset is adjusted to reduce the offset.

Regarding claim 17, Matsuzaki teaches all subject matter claimed, as applied to claim 8. Matsuzaki further teaches wherein the clock signal exhibits different frequencies during successive cycles, the energy of the clock signal being spread equally over the different frequencies. (note col.7, lines 52-59)

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Jeong** ('884, cited in the IDS, paper no.4).

Regarding claims 3 and 4, Jeong teaches all subject matter, as applied to claim

1. Jeong illustrates a clock period (see Fig.5 and 6) and having a phase difference of 0.2π . Although Jeong does not explicitly disclose difference between two clock periods is about 50 picoseconds or more, it would have been obvious to one skilled in the art at the time of invention to design a system such as a reference clock having a certain clock speed operating in Jeong's system would be capable of having the difference between two clock periods having about 50 picoseconds or more, as is a matter of a design choice. Depending on the market availability and the need for operating the system at a certain clock speed, one skilled in the art would design a system resulting in having a difference between two clock periods having 50 picoseconds or more.

8. Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over by **Matsuzaki** et al. ('930).

Regarding claims 3 and 4, Matsuzaki teaches all subject matter, as applied to claim 1. Although Matsuzaki does not explicitly disclose difference between two

clock periods is about 50 picoseconds or more, it would have been obvious to one skilled in the art at the time of invention to design a system such as a reference clock having a certain clock speed operating in Matsuzaki's system would be capable of having the difference between two clock periods having about 50 picoseconds or more, as is a matter of a design choice. Depending on the market availability and the need for operating the system at a certain clock speed, one skilled in the art would design a system resulting in having a difference between two clock periods having 50 picoseconds or more.

9. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over by **Matsuzaki et al.** ('930) in view of Tomita ('309).

Regarding claim 6, Matsuzaki teaches all subject matter claimed, as applied to claim 1. However, Matsuzaki does not teach the step of generating an overflow signal if the delay trim units enabled in the adjustable delay line reach a predetermined level. Tomita teaches, in the same field of endeavor, sending an overflow signal when the delay range reaches the upper limit. (note col.4, line 62 – col.5, line 5) It would have been obvious to one skilled in the art at the time of the invention to include Tomita's teaching of overflow detection circuit in Matsuzaki's system by placing the circuit, as configured in Fig.2 with 13 receiving variable delay elements and clock input, and therefore allowing the clock input to bypass the variable delay elements when overflow is detected, for the purpose of

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saving power consumption, as delaying clock input when overflow is detected is meaningless.

Allowable Subject Matter

10. Claims 11-16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

11. The following is a statement of reasons for the indication of allowable subject matter:

Present application discloses DLL circuit which receives an input clock signal and generating a reference clock signal by delaying the reference signal through plurality of delay elements. The delay elements are enabled by control signals, which results in varying the clock period. The control signals are generated in a predetermined pattern. Closest prior art, Matsuzaki, teaches all the elements explained above. However, Matsuzaki does not teach the control signal having a predetermined pattern where the pattern comprises different values as recited in claims 11-16. Therefore, prior art does not teach all the elements claimed.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Ghosahl, Donnelly et al., Spagnoletti et al. and Ishimi et al. teach receiving a clock signal and delaying the signal through delay elements.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Sam Ahn** whose telephone number is **(703) 305-0754**.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Stephen Chin**, can be reached at **(703) 305-4714**.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks
P.O. Box 1450
Alexandria, VA 22313-1450

or faxed to:

(703) 872-9306

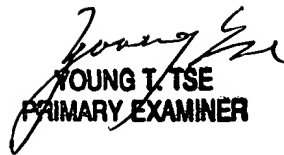
Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA., Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

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Sam K. Ahn
11/24/03


YOUNG T. TSE
PRIMARY EXAMINER